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STRICTURES OF THE URETHRA SITUATED AT
OR NEAR THE MEATUS:

THEIR CAUSES, NATURE, AND TREATMENT.

TOGETHER WITH A DESCRIPTION OF A NEW MEATOTOME.

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STRICTURES OF THE URETHRA SITUATED AT OR NEAR THE MEATUS: THEIR CAUSES, NATURE, AND TREATMENT.

TOGETHER WITH A DESCRIPTION OF A NEW MEATOTOME.

AMONG the direct consequences of gonorrhœal inflammation of the male urethra, stricture of the urethra is by far the most frequent result, and to its influence, direct and indirect, the origin and continuance of most chronic urethral affections may be ascribed. The stricture or strictures may be situated directly at the meatus, or may occur in any portion of the urethral canal between the meatus and the prostate gland. In regard to the frequency of its occurrence in these situations, several different views have been advanced. According to Sir Henry Thompson, sixty-seven per cent. of all strictures are situated within the membranous portion of the urethra, sixteen per cent. are located in the region between the membranous urethra and within two and a half inches of the meatus, and seventeen per cent. occur either at the meatus or within two and a half inches of this point. The senior Gross differs from the above in placing the point of greatest frequency in that portion of the urethra situated between the scrotum and the head of the penis, and the point of least frequency at or near the meatus. The measurements of Sir Henry Thompson were obtained from post-mortem specimens. On the other hand, Dr. S. W. Gross,* in a tabulated statement of 173 cases of stricture, where the measurements were made on the living subject with the bulbous bougie, places the points of relative frequency as

follows: 76, or 43.93 per cent., in the posterior portion; 48, or 27.74 per cent., in the middle portion; 49, or 28.32 per cent., in the anterior portion of the urethra, or at the meatus.

Dr. Fessenden N. Otis, of New York, whose indefatigable labors on this subject are well known, is a firm believer in the greater frequency of strictures in the spongy portion of the urethra or at or near the meatus. In a *résumé* of 258 cases,† he places the points of relative frequency as follows: 52 at the meatus or within the first quarter-inch of the urethra; 63 in the following inch, viz., from $\frac{1}{4}$ to $1\frac{1}{4}$; 48 from $1\frac{1}{4}$ to $2\frac{1}{4}$; 48 from $2\frac{1}{4}$ to $3\frac{1}{4}$; 19 from $3\frac{1}{4}$ to $4\frac{1}{4}$; 14 from $4\frac{1}{4}$ to $5\frac{1}{4}$; 8 from $5\frac{1}{4}$ to $6\frac{1}{4}$; 6 from $6\frac{1}{4}$ to $7\frac{1}{4}$.

Dr. Otis has also advanced the theory that many supposed cases of deep-seated stricture are not organic, but spasmodic, owing their existence to the reflected irritation of an undetected stricture, generally of large calibre, situated in the anterior part of the canal.

Dr. Bevan, of Baltimore,‡ reports the measurements of 225 cases as follows: 38 in the first quarter-inch, including the meatus; 47 between $\frac{1}{4}$ and $1\frac{1}{4}$; 51 from $1\frac{1}{4}$ to $2\frac{1}{4}$; 50 from $2\frac{1}{4}$ to $3\frac{1}{4}$; 14 from $3\frac{1}{4}$ to $4\frac{1}{4}$; 11 from $4\frac{1}{4}$ to $5\frac{1}{4}$; 9 from $5\frac{1}{4}$ to $6\frac{1}{4}$; 5 from $6\frac{1}{4}$ to $7\frac{1}{4}$. Of these, 186, or 82 per cent., it can be seen, were located within the first $4\frac{1}{4}$ inches.

* New York Medical Record, 1875.

† Otis, Stricture of the Male Urethra, p. 206.

‡ New York Medical Record, December, 1880, p. 640.

My own experience has been similar to the above. In the records of 100 cases, 10 were situated at the meatus, or within the first quarter-inch; 38 from $\frac{1}{4}$ to $1\frac{1}{4}$; 22 from $1\frac{1}{4}$ to $2\frac{1}{4}$; 15 from $2\frac{1}{4}$ to $3\frac{1}{4}$; 9 from $3\frac{1}{4}$ to $4\frac{1}{4}$; 6 from $4\frac{1}{4}$ to $7\frac{1}{4}$ inches.

Summing up these cases, we find, from the measurements of S. W. Gross, Otis, Bevan, and myself, in all amounting to 756 cases, that 418, or 55.4 per cent., were located in the first $2\frac{1}{4}$ inches; 203, or 26.9 per cent., from $2\frac{1}{4}$ to $4\frac{1}{4}$ inches; and 135, or 17.7 per cent., from $4\frac{1}{4}$ to $7\frac{1}{4}$ inches. Should we leave out the results of Dr. S. W. Gross, the discrepancy from Sir Henry Thompson's measurements becomes still greater. In 583 cases, 369, or 63 per cent., were situated within $2\frac{1}{4}$ inches of the meatus, or 524, or 90 per cent., were located within $4\frac{1}{4}$ inches of the meatus.

The discrepancies between the two sets of observers represented by Thompson for the one class and Otis for the other may be largely explained when we consider that the observations of the former were founded upon examinations of post-mortem specimens, and only such cases of stricture were enumerated as were apparent after death. Otis, Gross, and Bevan made their measurements upon the living subject, and no doubt counted in a number of slight constrictions, probably not apparent after death, which their opponents would not admit to be organic strictures at all, but which nevertheless were proved by the results of treatment to be a fruitful and continued source of evil. The greater percentage of strictures in the anterior portion of the urethral canal would also seem to be but a logical sequence to the course of a gonorrhœa. We know that the disease usually begins at the meatus and gradually travels backwards along the urethra, diminishing in virulence as it proceeds, and we therefore should expect to find most traces of inflammatory action at points where the pathological process has been most intense. Moreover, we know from clinical experience that in over fifty per cent. of cases of gonorrhœa the disease does not affect more than the first three inches of the urethra. We should therefore justly expect the greater number of strictures from specific urethral inflammation to be situated in the anterior portion of the canal; and our expectation has been

borne out by the facts. Strictures of the deep urethra more generally are the results of traumatism; they may also occur from gonorrhœa, but then are the result of frequent attacks, and are usually accompanied by one or more anterior strictures. A potent factor in the question may be found in the fact that different methods of diagnosis have guided the observers. The old school, under Sir Henry Thompson, relied upon post-mortem specimens, and the indications afforded during life by explorations made with the steel bougie or sound. The new school, of which Otis is the originator and most shining light, base their conclusions upon careful measurements taken from the living subject with accurate diagnostic instruments, such as the urethrometer and bulbous exploratory bougie, and improved methods of research. It may be added that the weight of recent medical testimony is overwhelmingly in favor of the new school, and Sir Henry Thompson himself, in a recent address, has practically admitted the truth of their conclusions. From these facts we can readily understand that strictures at or near the meatus must necessarily comprise the majority of the cases which are brought to the notice of the physician. A few points concerning their origin and treatment may therefore prove interesting.

Strictures of the urethra of specific origin, whether deep-seated or located in the region of the meatus, bear a distinct and direct relation to gleet and chronic urethral discharges. I do not think I make an extravagant statement when I assert that out of one hundred cases of urethral inflammation in which the discharge lasts over three months fully ninety or more owe their continuance to the presence of an organic stricture of the urethra. Cases of long-standing gleet discharges, exceedingly rebellious to ordinary methods of treatment, are but too common, and in many cases the failure to cure may be ascribed either to deficient knowledge on the part of the physician or to a neglect of careful urethral exploration with proper diagnostic instruments. The average practitioner is satisfied with writing a prescription for a copaiba mixture or an injection of sulphate of zinc and opium, and never thinks of doing anything more. Should he be more enlightened, he is too apt, unfortunately, to make his urethral explorations with the ordinary conical steel

sound, and, finding with it no stricture, conclude that none exists. *The fact is not sufficiently recognized that the meatus is not a correct index to the calibre of the urethral canal.* It may be contracted by cicatricial tissue, by traumatism, by disease, or may exist contracted congenitally, and hence must be a faulty and imperfect gauge. The dimensions of the urethral canal may be much larger behind this contraction, and an instrument which is sufficiently small to be passed through the meatus will entirely fail in detecting any stricture of large calibre situated behind. Narrow and tight strictures can of course be easily detected by this imperfect method of examination, but in such cases their presence is also indicated by other characteristic signs. Where strictures of large calibre occur,—and they constitute by far the greater majority,—they must, however, pass entirely unrecognized.

It has been my peculiar province to meet with quite a number of cases of chronic urethral discharge where the patients had been pronounced by previous medical advisers to be perfectly free from stricture. In almost all of these cases I have found the trouble to proceed from one or more strictures of large calibre situated either at the meatus or from one-quarter to one and one-half inches back. These latter strictures were generally linear, forming a band several lines in extent and thickness, and elastic in character. They were accompanied by localized patches of granular inflammation, or else immediately behind the stricture would be found a small area more or less denuded of mucous membrane, and inflamed to a degree sufficient to bleed upon slight pressure. In many cases, also, the influence of the stricture would be sufficient to cause a sensitive and hyperæsthetic condition of the mucous membrane of the whole canal. In all of these cases, however, there was increased sensitiveness of the membranous and prostatic portions of the urethra, and in several the hyperæsthesia was so great as to render the introduction of an exploratory instrument in that region a matter of extreme difficulty. When the point of the instrument reached the membranous region, the spasmodic contraction of the muscles was such as to prevent for a time its passage and to strongly simulate organic stricture. Other symptoms common to these cases besides the discharge were

pain in the lumbar regions, perineal pains, increased frequency of micturition, etc.

The recognition of this class of strictures is not an easy matter. They do not, as a rule, result from the more severe cases of gonorrhœa, for in such cases the amount of inflammation is sufficient to produce a stricture of well-marked and decided characteristics. On the contrary, from the history of a number of cases, they are more prone to result from light or “bastard” gonorrhœa (non-specific urethritis), in which there is not a high degree of inflammation. The discharge is scanty, whitish, and semi-albuminous in character, and slow to disappear, and there is little swelling of the urethra or pain on micturition. When the discharge continues for a month or two, this slow inflammatory action appears to develop the form of stricture above alluded to, probably by causing an agglutination of one or more of the delicate longitudinal folds which the urethra assumes in a state of rest. It also may be that this agglutination occurs at a point where there is already a slight transverse ruga of the urethra, and, by a minute deposit here of exuded lymph in the longitudinal fold, so diminish the calibre of the urethra at this point as to produce a thread-like stricture scarcely noticeable. Yet this insignificant constriction, by its irritation, can prolong indefinitely a urethral discharge. How?

It is a fact well known in physical experimentation that the velocity of a stream of liquid flowing through a tube is proportioned to the smoothness of the internal surface of the tube. Should the surface be rough, as, for instance, in a tube of cast iron, the velocity of the stream will be much less than in a tube of smooth glass, as the friction developed by the passing of the current over the inequalities of the iron will materially impede the flow. Moreover, at each minute inequality will be developed a point of friction or rubbing. Now, the urethra is simply a tube for the exit of the urine from the bladder, and is subject to the same physical laws. As the urine passes through the canal, this slight constriction, offering, as it does, an impediment to the current, will develop at this point a small amount of friction. Small as this amount is, its irritation is sufficient to keep up a discharge. It may be argued that the exploration of any normal urethra by means of a delicate instru-

ment might reveal transverse bands even more marked than that of the point of stricture. Why do not these produce an inflammation of the urethra in their close vicinity by means of the obstruction which they must offer to the smooth passage of the urine? It may be answered that in a healthy urethra the amount of friction developed at these points is not sufficient to *produce* inflammation. The urethra must be already inflamed, abnormal in its condition; then the irritation will be sufficient to keep the canal at this particular point in a state of subacute semi-chronic inflammation. This transverse ruga may therefore itself, from a normal part of the urethra, be developed gradually into a pathological structure by the gradual deposition of lymph or inflammatory swelling. Strictures of the meatus often are developed by the same process. A man may be born with a congenitally contracted meatus, and never while healthy suffer more than a temporary inconvenience from its presence. But let once gonorrhœa, even though it be of mild character, be contracted at this point, and the irritation of the stream of urine to the constricted meatus, before unproductive of harm, will now develop a state of affairs often to be remedied only by an operation out of all proportion to the original trouble. In fact, most strictures of the meatus are produced, or, more properly speaking, aggravated, in this manner. Very few cases of gonorrhœa are sufficiently severe to cause stricture of the urethra at this point, few are the results of traumatism, while the majority of cases brought to the surgeon for treatment are simply the results of gonorrhœal inflammation upon a congenitally contracted meatus.

As I have before stated, strictures of the above class are prolific causes of protracted urethral discharges. The discharge is not generally of a character sufficient to create much discomfort, but the patient, who is almost always exceedingly sensitive on this point, recognizes that there is a discharge, and gives himself an amount of mental disquietude out of all proportion to the gravity of the case. These strictures escape detection for two reasons: first, the physician, from the history of the case and the lightness of the attack, does not suspect that a stricture exists; second, the urethral exploration, if performed at all, is not done with proper instruments or with sufficient care. I must reiterate,

even at the risk of seeming tedious, that it is impossible to detect a slight stricture of large calibre with the ordinary conical steel sound. The weight and tapering extremity of the instrument cause it to act as a wedge; and, as the stricture is always elastic, it is so gently dilated as to cause no interruption to the smooth passage of the sound. The proper diagnostic instrument is the bulbous exploratory bougie, either that of metal, as recommended by Otis, or the French *bougie à boule*, made of rubber-covered webbing. My own preference is for the latter, as its lightness, flexibility, and elasticity allow of a delicacy of manipulation impossible with the metal instrument, and it imparts to the fingers of the operator indications of the slightest inequality or irregularity in the canal. He must be prepared to notice these, for, the stricture being of a slight character, the passage of the instrument may so dilate it as to render it entirely unrecognizable for the remainder of the sitting. Should a hitch or slight obstruction be noticed in passing over any point, the bougie should be at once gently withdrawn, so as to indicate by the resistance offered to the blunt shoulder of the instrument the exact location of the stricture. This location will be shown by the feeling imparted to the fingers of a slight "roll" or jump as the tip passes over the point of obstruction. The bougie should be carefully examined when withdrawn from the urethra, and should the "roll" of the instrument be accompanied by the presence of blood or muco-purulent bloody matter behind the shoulder of the acorn-tip, it may be regarded as proof positive that a stricture exists. In cases where the meatus is at all contracted, and also where exploration by the previous method has produced no results, the urethrometer devised by Dr. Otis should be employed. This allows the bulb of the instrument to be expanded after its passage through the meatus, and thus will detect a stricture whose diameter, while less than that of the urethra, is greater than that of the meatus, and which could not be recognized by an instrument small enough to pass through the latter.

The next question is as to treatment. The methods of treatment may be summed up as follows: gradual dilatation, rapid dilatation, internal urethrotomy, and electrolysis. Of all these methods, gradual dila-

tation may be regarded as the most used and the most useless. While in strictures of the deeper parts of the urethra this course may produce good results, in the treatment of the special classes of strictures to the consideration of which this paper is devoted it is productive of no good whatever. Thousands of patients all over the United States are, and probably have been for the past several years, passing with painful regularity a bougie for the relief of a chronic gleet or an organic stricture. The greater majority of these are not one whit better than when the treatment was first commenced. Space will not permit me to go into a lengthy argument on this point: suffice it to say, briefly, that treatment of strictures, particularly when of large calibre and when situated near the meatus, is not successful by the method of gradual dilatation, for several reasons. The character of the tissues, the limited size of the meatus, and the elastic nature of the stricture render all treatment of this character either negative or positively harmful. What physician with any experience in urethral surgery cannot call to mind scores of cases where the patient had been "bougie'd" *ad nauseam* without any beneficial result? As a therapeutic remedy, gradual dilatation ranks high in various obstinate urethral affections, but in the treatment of strictures at or near the meatus it is worse than useless.

Rapid dilatation is not much more successful. In tough and resisting strictures of the pendulous urethra very good results have been achieved, particularly where the dilating instrument used has been constructed on the principle of the Otis urethrometer,—that is, by the expansion of a portion of the instrument only, without including the meatus in the expanded portion. In elastic strictures, however, and in cases where the stricture is situated within the limits of the penis, the elastic character of the stricture or the non-dilatable tissues of the glans render the operation impracticable. The tissues of the glans do not allow of much dilatation, and consequently great pain is produced by any effort to produce the amount of stretching necessary to success.

As a rule, internal urethrotomy affords the best results in these cases. It is now a settled and recognized plan of treatment among all enlightened physicians to cut strictures of the meatus. The same method

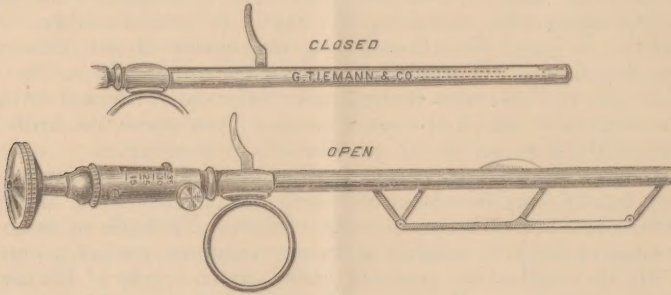
applies equally well to those situated not deeper than four inches from the meatus, particularly when the stricture is elastic in character. In fact, these latter can only be removed by an incision, as dilatation but stretches them, and when the dilator is removed they relapse to their original condition. Urethrotomy effectually severs the band, and consequently allows the canal to regain its normal calibre. An expanding instrument of the Otis plan should always be employed, as the stricture is more effectually divided with a slighter incision than where the knife is used on the flaccid urethra.

The instruments recommended for incising the meatus have always been unsatisfactory. A knife of some shape, bistoury, tenotome, scalpel, pointed or blunt, or the *bistouri caché* of Civiale, have been usually employed. The latter instrument has long ago been retired into well-merited obscurity, and the knife is the only method. The trouble is with this that either too little or too much cutting is done. The impossibility of accurate measurement, the profuse bleeding of the parts, the unsteadiness of the hand of the operator, the retraction of the penis, are all difficulties which tend to interfere with a perfect result. The patient, if anything, is cut too much, and he goes around with an immense slit in the end of his penis, which, from the destruction of the natural shape of the outlet, causes much discomfort in urination.

In operating upon cases of stricture of the meatus, and in other cases where the stricture was situated a short distance behind the meatus, I have been accustomed to use the admirable urethrotome No. 4 of Dr. Otis. For such purposes, however, the instrument is large and consequently inconvenient, calling for the use of both hands, and thus requiring the services of an assistant. I therefore, after some thought, devised the following little instrument, based upon the same principles as the urethrotome of Otis. I wished to obtain a small compact instrument, capable of operating upon all strictures within two and a half inches of the meatus, which I could manage with one hand, and which would cut with exactness and regularity. For the successful accomplishment of my desires I am much indebted to Messrs. Tiemann & Co., of New York, by whom the instrument has been constructed.

The instrument consists of a straight rod of steel, about four inches long, attached to a short handle. This rod is hollow, and conceals on the upper side a movable knife-blade, and on the lower side an expanding bar similar to that used in all of Otis's instruments. The expansion of this bar is regulated by a milled head forming part

the incision made by the knife accomplishing the rest. The operator now steadies the penis with one hand, pressing the sides rather tightly against the instrument within, so that there shall be no slipping, and, with the handle of the meatotome in his other hand, inserts the middle finger of this hand in the finger-ring, steadies the milled



of the handle of the meatotome, and the amount of expansion is indicated by an index moving up and down upon a graduated scale upon the upper surface of the handle. In my own instrument the amount of expansion ranges from No. 15 to No. 35, French scale; but it can be made greater or less, if necessary, in another instrument. The knife-blade is attached to a concealed steel rod sliding through the hollow rod of the instrument and terminating at the rear in a finger-piece or shoulder. The blade can be completely withdrawn, if necessary, for purposes of cleansing. A finger-ring placed on the under side of the handle completes the instrument. I should also say that the knife-blade is somewhat larger than usual, and is so arranged as to be concealed when in place. The withdrawal of the knife-rod causes the knife to project at once from the upper surface of the instrument. The cut represents it as both closed and open.

The method of operation is as follows. The patient is placed in a reclining position, the exact location of the stricture having been previously ascertained. The closed meatotome is well oiled, and the rod gently inserted in the urethra until the extremity containing the knife is about one-quarter of an inch beyond the stricture. The milled head is then rotated until the expanding bar dilates the urethra to the proper degree, previously determined. For instance, should it be determined to bring the meatus up to 30 Fr., the instrument is dilated to 23 or 25 Fr.,

head firmly against the palm of his hand, and, by his forefinger pressing against the finger-rest, forcibly withdraws the knife. As the knife is withdrawn, it comes in contact with the band of stricture kept tense and dilated by the expansion of the instrument, and effectually incises it. The milled head is reversed so as to contract the expanding bar, the knife returned to its place, and the meatotome withdrawn. Should the operation be at or very near the meatus, this will not be necessary, as with the cut the whole instrument will slip forward and out. Should it be necessary, the stricture can be still further divided by reinserting and expanding the meatotome, and again cutting; but one operation is generally all that is necessary. I have now operated with this instrument in a number of cases, with gratifying results, and it has met with similar success in the hands of several of my friends who have used it repeatedly. It cuts quickly, evenly, and with perfect exactness, and with a little experience the operator can so regulate the expansion as to cut the meatus or the stricture to just the size desired, neither more nor less. Its small size,—being altogether only five and a half inches long, it can be easily carried in the vest-pocket,—its compactness, accuracy, and ease of manipulation, will, I think, commend it to all. Its great excellence, in addition to its precision, is that as the instrument can be manipulated almost entirely with one hand, the other is left free to manage the penis; and I need hardly tell any one how much better the

surgeon can do his work with the co-ordination of his own two hands than when he is dependent upon the services of another. A peculiar feature that I have noticed while using the instrument is the small amount of pain occasioned. The stretching of the urethra seems to obtund the sensibility of the nerve-filaments, and, as the operation is over in a moment, the patient is extremely gratified by the rapidity and slight discomfort of the process.

The uses of this little instrument do not end here. I believe it to be exceedingly well adapted for like operations upon the female urethra, upon the os uteri, for dilating and opening fistulous tracts, and, in fact, performing any dilating and cutting operation upon a short, narrow, and contracted passage. I have found it good practice after these operations to use a short urethral suppository or medicated bougie of a sedative and slightly astringent character. It separates the divided tissues and keeps them from reuniting, and, at the same time, encourages the unhealthy spots

of mucous membrane to healthy action. I have not found it necessary to resort to the usual plan of after-treatment with sounds, believing that my cases have done better without their use. They only irritate and do not produce much benefit. If the stricture is properly divided, there is little or no danger of subsequent contraction of the parts.

In reference to electrolysis I have said nothing, having had no experience in its use. From the brilliant results obtained by Dr. Newman, of New York, in the treatment of a number of cases of narrow and deep-seated strictures, I believe its use would be attended with much success in those of larger calibre. My purpose in this paper has been simply to direct the notice of the profession to the neglect of proper examination and treatment of many obstinate and annoying cases of urethral discharge; and should I have succeeded in throwing any more light upon the subject, I shall feel fully repaid for my labors.

839 RACE ST., PHILADELPHIA, December 10, 1882.

